

## SECTION 11 40 00

## AIR DOORS

**Berner Series ZEPHYR** air doors are designed for opening heights from 2 ft to 8 ft for environmental separation and from 2 ft to 7 ft for insect control. ZEPHYR is ideal for pass-thru windows.

At exterior openings, air doors can resist winds up to 8 MPH and are generally mounted inside building to recirculate warm air, which has risen towards ceiling. Air doors may not be fully effective where negative air pressure exists on one side of door; contact Berner for additional information.

ZEPHYR Series air doors have 1/5 HP motors. They can be wall mounted or suspended from the ceiling. Electric heated units shall be installed indoors only and have a minimum clearance of at least 6 feet between the bottom of the unit and the floor and at least 1 inch between the sides and top of the unit and any combustible material.

Edit guide specification to include only information specific to your project. Delete or add text, select appropriate bracketed phrases, and fill in blanks as required. Go to Berner catalog or website to select specific models and sizes that are required for project and to obtain data necessary to edit this specification section.

Coordinate specification with information shown on project drawings and schedules. In general, drawings indicate locations of air doors and switches and special mounting requirements, while sizes and capacities of air doors and utilities should be described in specifications or schedules. Cross check mechanical and architectural drawings.

This guide specification is available in word processing format at [www.berner.com](http://www.berner.com). Turn on "Hidden Text" function in your word processor to display "Specifier Notes."

For additional information or name of Berner representative in your area, call Berner International Corporation at 800-245-4455 in U.S. or 800-242-4455 in Canada, or visit [www.berner.com](http://www.berner.com). A selection guide is available at [www.berner.com](http://www.berner.com) to suggest models appropriate for typical applications.

## PART 1 - GENERAL

## 1.1 CONDITIONS AND REQUIREMENTS

- A. The General Conditions, Supplementary Conditions, and Division 01 – General Requirements apply.

## 1.2 SECTION INCLUDES

*Specifier Note: Delete options in the first paragraph below that are not included in this section. Retain only those options in the first paragraph below that are required for a specific project. Delete all options in the first paragraph below if heated air doors are not required.*

- A. Air doors[, electric heated] [, hot water heated] [, steam heated].
- B. [Insert item description.]

### 1.3 RELATED REQUIREMENTS

*Specifier Note: In this article, specify work specified in other sections that is related to work of this section.*

- A. Section 04 22 00 - Concrete Unit Masonry: Blocking or reinforcing in wall as required for attachment of air door.
- B. Section 05 40 00 - Cold-Formed Metal Framing: Reinforcing in wall as required for attachment of air door.
- C. Section 06 10 00 - Rough Carpentry: Blocking in wall as required for attachment of air door.

*Specifier Note: If switches for air doors are mounted on door frames, retain either Section 08 11 00 or 08 41 00 below to facilitate coordination.*

- D. Section 08 11 00 - Metal Doors and Frames: Coordinate installation of switches.

*Specifier Note: Strip doors can be used in conjunction with air doors to provide an even higher level of separation. Retain first paragraph below if required for a specific project. Consult Berner catalog for a complete list of available strip doors.*

- E. Section 08 38 13 - Flexible Strip Doors: Coordinate installation of strip doors with installation of air doors.
- F. Section 08 41 00 - Entrances and Storefronts: Coordinate installation of switches.

*Specifier Note: Retain the following paragraph if door openers or automatic door opening assemblies are used. Air door must be positioned so air stream is not obstructed when deflected 20 degrees to either side of centerline. If air stream strikes any obstruction (top edge of the doorway, door opening device, etc.) effectiveness of unit will be reduced.*

- G. Section 08 71 00 - Door Hardware: Coordinate with installation of hardware.

*Specifier Note: Retain any of the three following paragraphs if air doors are mounted above ceiling. Delete if no units installed above ceiling.*

- H. Section 09 22 16 - Non-Structural Metal Framing: Framing and blocking above ceiling as required for installation of air door.
- I. Section 09 29 00 - Gypsum Board: Ceiling finish abutting air door.



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- J. Section 09 51 13 - Acoustical Panel Ceilings: Ceiling finish abutting air door.

*Specifier Note: Retain the first paragraph below if air door cabinets are to be field painted. Protect electrical contacts and moveable parts from paint.*

- K. Section 09 91 00 - Painting: Field applied finishes.

*Specifier Note: Retain the following paragraph if hot water heaters are used in air doors.*

- L. Division 22 - Plumbing: Connection of hot water supply to heater used in air doors.

*Specifier Note: Retain the following paragraph if steam heaters are used in air doors.*

- M. Division 23 - Heating, Ventilating, and Air-Conditioning (HVAC): Connection of steam supply to heater used in air doors.

- N. Division 26 - Electrical: Connection of electrical service and controls.

*Specifier Note: The following paragraph is a sample that may be used in this article. Add to or delete from the following as appropriate for the specific project.*

- O. Section [xxxxx] – [Section Title]: [Include brief description of work specified in another section that is related to the work of this section.]

### 1.4 REFERENCE STANDARDS

*Specifier Note: Retain the following paragraph and subparagraph if steam or hot water heated units are required for a specific project.*

- A. Air Conditioning & Refrigeration Institute (ARI):

1. ARI 410 - Forced-Circulation Air-Cooling and Air-Heating Coils.

- B. Air Movement & Control Association International, Inc. (AMCA):

1. AMCA 211 - Certified Ratings Program - Product Rating Manual for Fan Air Performance.
2. AMCA 222 - Application Manual for Air Curtain Units.

- C. National Electrical Manufacturers Association (NEMA):

1. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).

- D. Underwriters Laboratories (UL):

1. UL 507 - Electric Fans.
2. UL 2021 - Fixed and Location-Dedicated Electric Room Heaters.

### 1.5 SUBMITTALS

*Specifier Note: In this article, specify various types of data to be furnished by the contractor before, during, or after construction. Topics included in this article are: product data, shop drawings, samples, design data, test reports, certificates, manufacturers' instructions, manufacturers' field reports, qualification statements, and closeout submittals.*

- A. Submit under provisions of Section [01 33 00] [\_\_\_\_\_].
- B. Product Data: Submit for each type of air door specified including:
  - 1. Rated capacities.
  - 2. Operating characteristics.
  - 3. Accessories.
- C. Shop Drawings: For air door components not adequately described by product data. Show configuration of non-standard units. Include plans, elevations, sections, details, and attachments to other work.
  - 1. Indicate dimensions, weights, loads, clearances required, location and size of field connections.
  - 2. Provide wiring diagrams for power, signal, and control wiring.
- D. Operation and Maintenance Data: For air doors to include in maintenance manuals.
- E. Warranties: Sample of special warranties.

## 1.6 QUALITY ASSURANCE

*Specifier Note: In this article, describe qualifications, regulatory requirements, certifications, field samples, mock-ups, and pre-installation meetings.*

- A. Manufacturers: Firms regularly engaged in manufacture of air doors of the types and sizes required, whose products have been in satisfactory use in similar service for not less than 10 years. Provide air doors produced by a manufacturer listed in this section.
- B. Source Limitations: Obtain each type of air door through one (1) source from a single manufacturer.
- C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

*Specifier Note: Retain the following paragraph if specifying the ambient type of air curtain in this section.*

- D. Comply with AMCA 211 for airflow rate, average outlet velocity, outlet velocity uniformity, velocity projection, and power rating.
- E. Unheated and electric heated units to be UL Listed in the United States and Canada.

## 1.7 DELIVERY, STORAGE AND HANDLING

- A. Deliver air doors in factory labeled packages.
- B. Store and handle in strict compliance with manufacturer's written instructions and recommendations.
- C. Protect from damage due to weather, excessive temperature, and construction operations.

## 1.8 WARRANTY

- A. Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of air doors that fail in materials or workmanship within specified warranty period.

*Specifier Note: Retain either of the following two subparagraphs to agree with type of unit selected for a project and delete the other. Retain both subparagraphs if project has both types of units.*

- 1. Five-year limited warranty for unheated (ambient) units.
- 2. Two-year limited warranty for heated units.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Basis-of-Design Manufacturer: The design for air doors is based on products manufactured by Berner International Corporation, 111 Progress Avenue, New Castle; PA, Telephone: 724-658-3551; Toll-Free Telephones: 800-245-4455 (U.S.), 800-242-4455 (Canada); Fax: 724-652-0682; email: [airdoors@berner.com](mailto:airdoors@berner.com); Website: [www.berner.com](http://www.berner.com).

*Specifier Note: Retain one of the following two paragraphs and delete the other.*

- B. Substitutions are not permitted.
- C. Substitutions will be considered under provisions of Section 01 60 00.

### 2.2 AIR DOORS

*Specifier Note: Retain model types in the following paragraph as required for specific project. Delete those that are not required.*

- A. Acceptable Products: Berner Model [ZEPHYR Ambient] [ZEPHYR Electric Heated] [ZEPHYR Hot Water Heated] [ZEPHYR Steam Heated].



## ZEPHYR GUIDE SPECIFICATIONS

- B. Construction: Provide factory-assembled units of sufficient structural strength to be supported from ends without intermediate support. Ship units completely assembled.
- C. Cabinet:

*Specifier Note: ZEPHYR cabinet is provided standard in clear anodized aluminum. Optional finishes are stainless steel, bronze anodized aluminum, or custom painted colors. Delete finishes that are not required for a specific project.*

1. Material and Finish: [[Clear] [Bronze] anodized aluminum] [Stainless steel] [[Insert color selection] colored baked enamel finish] [[Insert color selection] powder coat]. Riveted construction with stainless steel rivets.
2. Dimensions: Not to exceed 7-1/2 inches high by [nine (9)] [13-3/4] inches deep.

*Specifier Note: Retain only the mounting method required for a specific project in the following subparagraph and delete the others.*

3. Mounting: Provide for [top of wall] [suspended] mounting.
- D. Motors: 1/5-HP, single phase, variable speed, direct driven, 1600 RPM, resilient mounted, continuous duty type with internal thermal-overload protection and sealed ball bearing permanently lubricated.
- E. Fans: Balanced forward curved cross flow tangential type, flexible hubs mounted in matched fan scrolls. Manufacture wheels from aluminum.
- F. Discharge Nozzles:
1. Provide uniform velocity across width of air door.
  2. Aperture: Two (2) inch slot by width of air door.
- G. Vanes: 7/8 inches minimum height; constructed of airfoil-shaped aluminum extrusions; adjustable plus or minus 20 degrees to deflect airflow.
- H. Inlet:
1. Location: Front.
  2. Screen: Perforated aluminum with extruded aluminum frame.

*Specifier Note: Retain the following article if heated units are required for a specific project.*

### 2.3 HEATING ELEMENTS

- A. Electric Heating Coil: UL-approved, factory-mounted, factory-wired, thermally-protected, in galvanized steel frame.
1. Helical coil with point suspension of elements, [single] [three (3)] phase.
  2. Thermal Cutout: Locks out electric heater when prolonged abnormal over-temperature conditions exist.

- B. Steam Coil: Certified in accordance with ARI 410; 16-gage galvanized steel casing, 5/8-inch (15.8 mm) outside diameter copper tube with aluminum fins and seamless copper headers.
1. Characteristics: Design to operate at maximum 150-psig (1035-kPa) and 366 degrees F (185 degrees C) steam.
  2. Leak-test under water at 350-psig (2413-kPa) dry nitrogen.
  3. Factory mount coil on air intake and protect with perforated metal screen.
- C. Hot Water Coil: Certified in accordance with ARI 410; 16-gage galvanized steel casing, 5/8-inch (15.8 mm) outside diameter copper tube with aluminum fins and seamless copper headers.
1. Characteristics: Design to operate at maximum 250-psig (1720-kPa) and 300 degrees F (149 degrees C) hot water.
  2. Leak-test under water at 350-psig (2415-kPa) dry nitrogen.
  3. Factory mount coil on air intake and protect with perforated metal screen.

## 2.4 CONTROLS

A. Controller:

1. UL listed, industrial type, pre-wired, with solid-state control switch.

*Specifier Note: ZEPHYR units are supplied standard with an Intelliswitch digital programmable controller.*

2. Factory-mounted and wired Intelliswitch digital programmable controller with the following features:
  - a. 5 volt DC output for control circuit.
  - b. Lock and Unlock tamperproof feature.
  - c. Motor and switching suitable for 10 fan speed settings.
  - d. Programmable fan start and fan stop time with provisions to set the start and stop times for any of the week.
  - e. Programmable settings for all user controlled options.
  - f. Adjustable time delay from 0 to 10 minutes.
  - g. Five (5) preset and three (3) customizable programs - On, Off, Automatic, Deluxe, Comfort Plus, Program 1, Program 2, and Program 3.
  - h. Fan fail lockout.
  - i. Built-in capillary style thermostat for heated units with temperature settings of 34 degrees F to 90 degrees F (one (1) degree C to 32 degrees C).
  - j. Two (2) heating modes, one (1) call for heat and one (1) call for fan and heat.
  - k. Emergency stop.
  - l. Clock with lighted display.
3. [Unit mounted display] [Remote mounted display with 20 ft (6.1m cable)].



*Specifier Note: Retain the following subparagraph if an automatic door switch is required for a specific project. An automatic door switch automatically activates unit when door opens and deactivates unit when door closes.*

- B. Door Switch: [NEMA [1] [4] plunger] [NEMA 1 roller] [magnetic] style door switch.

*Specifier Note: Retain the following remote control option with Intelliswitch digital programmable controller if required for a specific project.*

- C. [Remote Control: Infra-red controller for use with Intelliswitch digital programmable controller.]

*Specifier Note: Retain the following paragraph when specifying electric heated units.*

- D. Thermostat: Prevents operation of heater when inside air temperature exceeds desired temperature.

*Specifier Note: Use of a disconnect switch on unit simplifies power shut-off when servicing air door.*

- E. Disconnect Switch: Provide [factory] [remote] mounted non-fused toggle disconnects based on number of power supplies required.

*Specifier Note: Retain the following paragraph and insert text describing coordinating operational sequence of air door controls if required.*

- F. Sequencing: [\_\_\_\_\_].]

## 2.5 MOUNTING ACCESSORIES

*Specifier Note: Show mounting brackets on Drawings if required.*

- A. Provide brackets and other mounting accessories as required to permit installation and proper functioning of air door to meet project conditions of use.

*Specifier Note: Retain the required material and finish in the following paragraph and delete the other one.*

- B. Fabricate mounting accessories from [[painted] aluminized] [stainless] steel:

*Specifier Note: Retain the applicable brackets from the list below and delete those not required for a project.*

1. [Wall Brackets: [0"-12"] [13"-20"].]
2. [Z-style 4-1/2 to seven (7) inch adjustable depth stainless steel mounting bracket.]

## PART 3 - EXECUTION



### 3.1 EXAMINATION

- A. Verify that door frame and adjacent construction are installed correctly and are ready to receive work of this Section.
- B. Verify that utilities are in correct location and are of correct capacities for specified products.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

### 3.2 INSTALLATION

*Specifier Note: Delete the optional text in the following paragraph if shop drawings are not required for a specific project.*

- A. Install air doors where indicated on Drawings and accordance with [shop drawings and] manufacturer's instructions. Provide clearance to permit servicing and maintenance.
- B. Securely install air doors plumb, level, and as close as practical to top of opening and face of wall.
- C. Install switches where indicated on Drawings.

### 3.3 CONNECTIONS

*Specifier Note: Retain the appropriate option in the following paragraph depending on type of air door(s) retained in Part 2 - Products and delete those not used.*

- A. Connect air door to utilities as specified in [Division 22] [Division 23] [Division 26] sections.

### 3.4 FIELD QUALITY CONTROL

- A. Provide a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.
- B. Test and operate air door to be sure that it performs as intended.

### 3.5 ADJUSTING

- A. Adjust fan speed to prepare installed products to perform properly.

*Specifier Note: Delete the optional text in the following paragraph if not required for a specific project.*

- B. Adjust discharge nozzles to deflect air outward [unless otherwise required].



## ZEPHYR GUIDE SPECIFICATIONS

### 3.6 CLEANING

- A. Clean air door prior to commissioning.
- B. Repair or repaint damage to finishes on exposed-to-view surfaces.

### 3.7 SYSTEM STARTUP

*Specifier Note: Retain optional text in paragraph below if required for a specific project.*

- A. Test and operate air doors to ensure that they perform as intended. Adjust discharge nozzles to deflect air outward [unless otherwise required].

### 3.8 DEMONSTRATION

- A. Demonstrate for Owner's maintenance personnel how to adjust, operate, and maintain air curtains.

END OF SECTION

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